REMARKS

Claims 1-56 were in the application as filed. In an April 10, 2003 Response to Restriction Requirement, Assignee canceled claims 1-20 and 43-56. In the Office Action, it is accurately noted that the Response to Office Action submitted on November 25, 2003 incorrectly referred to claims 1-20 and 43-56 as "withdrawn" rather than "canceled." This inadvertent designation is corrected herein, and this Response is intended to replace the November 25, 2003 submission.

Upon entry of the foregoing amendments, claims 21, 23-26, 28-31, 33-42, and 57 are pending in the application, and claims 22, 27, and 32 are cancelled herein. Claim 57 is newly added, and claims 21, 23, 26, 33, 34, 35, 37, 38 and 39 are amended herein. The Office Action notes certain formalities relating to the benefit claims in the application. In addition, the title is objected to as allegedly not being indicative of the invention to which the claims are directed.

In an Office Action issued on August 25, 2003 in connection with the present application ("the Prior Office Action"), claims 21-26 and 28-38 were rejected under 35 U.S.C. § 102 as being allegedly anticipated by Chen et al., U.S. Patent No. 6,518,156 ("*Chen*"), Edman et al., U.S. Patent No. 6,569,382 ("*Edman*"), or Heath et al., U.S. Patent No. 6,459,095 ("*Heath*"). In addition, claims 27 and 39-42 are rejected under the judicially created doctrine of obviousness-type double patenting as being allegedly unpatentable over claims 1-7 of Tour et al., U.S. Patent No. 6,430,511 ("*Tour*").

1.   *Priority Claims.* The Prior Office Action requests an update to the benefit claims of the present application. The Specification has been amended herein to update the status of pending applications if such pending applications have issued or been abandoned and to add serial numbers as appropriate.

2.   *Objection to the Title.* The Title is objected to as allegedly not being indicative of the invention to which the claims are directed. The Title is amended herein to "Method of Making a Nanoscale Electronic Component Comprising Programming with a Self-

Adaptive Algorithm." It is believed that such a Title is descriptive of the invention claimed. Reconsideration and withdrawal of the objection to the title is therefore requested.

3.   *The Section 102 Rejections.* Claims 21-26, and 28-38 were rejected under 35 U.S.C. § 102 (e) as being anticipated by "any one of" *Chen, Edman,* or *Heath.* Applicants respectfully traverse this rejection.

In particular, the Assignee submits that claims 21, 23-26, 28-31, and 33-38, as amended, are not anticipated by *Chen, Edman* or *Heath* because each of these references fails to disclose each and every limitation of these claims.

Claim 21 is an independent claim from which claims 23-26, 28-31, and 33-38 depend. Claim 21 has been amended to recite "a self-assembled nanocell" comprising "at least one input lead; at least one output lead; and a nano-network spanning the input lead and the output lead, wherein the nano-network comprises a random array of molecular circuit components, nanoscale components or the combination thereof," and wherein programming the nanocell comprises "applying a self-adaptive algorithm to reconfigure the molecular circuit components."

Significantly, nothing in *Chen, Edman,* or *Heath* teaches or suggests a nano-network spanning the input lead and the output lead, wherein the nano-network comprises a random array of molecular circuit components, nanoscale components or the combination thereof. Nor do *Chen, Edman* or *Heath* either teach or suggest programming the nanocell by "applying a self-adaptive algorithm to reconfigure the molecular circuit components."

Instead, *Chen* teaches a method for configuring nanoscale devices in a crossbar array of configurable devices wherein the method comprises changing a property of the configurable material to thereby configure the nanoscale devices (*Chen,* Abstract). The crossbar array of *Chen* comprises cross-points of one layer of metal or semiconductive lines, or wires, crossed by a second layer of metal or semiconductive nanoscale lines, or wires, with a configurable layer between the lines (*Chen,* col. 1, lines 51-55). *Chen* neither teaches nor suggests that me crossbar array may comprise a "self-assembled

nanocell" comprising "at least one input lead; at least one output lead: and a nano-network comprising a random array of molecular circuit components, nanoscale components or the combination thereof." Moreover, *Chen* defines "self-assembled" as a system that naturally adopts some geometric pattern because of the identity of the components of the system (*See Chen*; col. 2, lines 61-63). Nothing in *Chen* either teaches or suggests that a self-assembled nanocell can comprise a random arrangement of molecular components. One skilled in the art would know that the geometric pattern of *Chen* suggests an ordered and regular arrangement that is not consistent with a random array of molecular circuit components as disclosed and claimed in the instant application.

Edman appears to disclose a method and apparatus for the fabrication of micro-scale and nano-scale devices (*Edman*, Abstract). In particular, *Edman* seems to relate to the fabrication of devices comprising the steps of fabricating first component devices on a first support, releasing at least one first component device to a second support, and attaching the first component device to the second support (*Edman*; col. 7, lns. 10-14). *Edman* suggests that electrostatic and other forces may be employed to transport, position and orient components upon a suitably designed substrate (Edman; col. 7, lines 15-17). As described by *Edman*, the unique properties of DNA provide a programmable recognition code, which can be used for specific placement and alignment of sub- micron and nanoscale structures (*Edman*; col. 15, lines 15-18). *Edman* neither teaches nor suggests a method for fabricating nanoscale devices comprising providing "a self-assembled nanocell" having a "nano-network" comprising "a random array of molecular circuit components." Such "specific placement and alignment" of *Edman* is not a random array. Moreover, *Edman* cites an advantage of DNA polymers as providing a way to encode highly specific binding-site identities o[n] semiconductor or photonic surfaces and providing a way to specifically connect any of these locations (*Edman*; col. 12, lines 16-24). On the other hand, the present application teaches that "the nanocell is programmable regardless of the precise arrangement of the molecular components" (Application, paragraph [0012]). Therefore,

the "highly specific-binding identities and specific binding-site" teachings of *Edman* do are not consistent with the elements of claim 21.

Heath appears to disclose a route to the fabrication of electronic devices in which the devices consist of two crossed wires sandwiching an electrically addressable molecular species (*Heath*, col. 2, lines 14-17). The electrical tasks performed by the electronic devices taught by *Heath* are largely determined by the types of wires and interwire materials that are used (*Heath*, col. 4, lines 38-40). Depending on the molecules or materials used between the wires. *Heath* suggests that each junction can either display the types of electrical function described immediately on contact of the wires, or the junction can have a switching function that acts to connect or disconnect the two wires together electrically (*Heath*, cols. 4-5, lines 64-2). *Heath* further teaches that its tasks can be utilized to form a useful device in any one of three ways. First, if at least one of the wires is a doped semiconductor, then resonant tunneling between the two wires through the electronic states of the molecules will form a resonant-tunneling diode. Second, if the redox pair can be reversibly oxidized or reduced, and if there is voltage hysteresis in the oxidation or reduction current/voltage scan, the device can form the basis for a random access memory element. Finally, if the redox pair can be irreversibly oxidized or reduced, the device forms the basis for a read-only memory element (*Heath*; col. 8, line 56 through col. 9, line 3). As such, *Heath* does not disclose or suggest programming a nanocell wherein programming comprises "applying a self-adaptive algorithm." One skilled in the art would know that merely connecting/disconnecting wires to achieve electrical function as taught by *Heath* is markedly different than programming by applying a self-adaptive algorithm.

In view of the recitations in claim 21, as amended, that are neither taught nor suggested by *Chen*, *Edman*, or *Heath*, the Assignee respectfully requests that the §102 rejections be reconsidered and withdrawn, such that claim 21 may be allowed. Assignee further requests that the § 102 rejections of dependent claims 23-26, 28-31, and 33-38 be withdrawn, since each of these claims depends from and further limits independent claim 21 and must *a fortiori* also be allowable.

4.   *Obviousness-Type Double Patenting.* Claims 27 and 39-42 were rejected under the judicially created doctrine of obviousness-type double patenting as being allegedly unpatentable over claims 1-7 of Tour. Claim 27 has been canceled. Please note that the present application and Tour are not commonly owned. Therefore, a terminal disclaimer is not applicable.

Claims 39-42 are dependent upon independent claim 21. The Examiner does not allege that independent claim 21 is rejected under the judicially created doctrine of obviousness-type double patenting over claims 1-7 of Tour. Moreover, Applicants propound that independent claim 21 is not unpatentable over claims 1-7 of Tour. Therefore, since claims 1-7 of Tour do not render independent claim 21 unpatentable, it is submitted that claims 39-42 are patentably distinct from claims 1-7 of Tour. Since independent claim 21 is allowable, dependent claims 39-42 must *a ortiori* also be allowable, since they carry with them all the limitations of independent claim 21.

5.   *Other Informalities.* The disclosure was objected to because of alleged informalities. Paragraph [0032] on page 15, line 24, was objected to because of a blank. In addition, claim 37 was objected to because a comma is allegedly missing in the phrase "Inverse Half-Adder a Multiplexer." Applicants have amended the specification on page 15, line 24, to fill in the blank and have amended claim 37 to add the comma. Applicants therefore respectfully request reconsideration and withdrawal of the objections.

In addition. Applicants have amended paragraphs 26, 27, 50, 52, 56 and 132 of the specification to correct minor typographical errors.

6.   *New Claim.*

New claim 57 depends independent claim 21. Since independent claim 21 is submitted to be allowable, dependent claim 57 must *a fortiori* also be allowable. Therefore, it is submitted that all pending claims are in condition for allowance.

CONCLUSION

In view of the foregoing amendments and remarks, Assignee respectfully submits that each of the claims pending in the application is allowable, and that the application as a whole is in proper form and condition for allowance. If the Examiner believes that the application can be placed in even better condition for allowance, he is invited to contact the undersigned at the telephone number listed below.

Respectfully submitted,

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